

REMARKS

New claims 67-71 are added. Support for the new claims is provided by the originally-filed application by exemplary embodiments of the invention disclosed at, for example, pages 4-5 and 8. Reconsideration of the application in view of the amendments and the remarks to follow is requested.

Claims 9, 12, 14, 51-52, 55-56, 60 and 65 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chen et al. (4,975,221) in view of Tuttle (5,558,679) taken with Tsukagoshi et al. (5,843,251), Kropp et al. (5,362,421), or Inoue et al. (5,728,473). Claims 23-28, 53-54, 57-59, 61, 64 and 66 stand rejected under 35 U.S.C. §103(a) as being obvious over Chen et al. in view of Tuttle. Claims 62-63 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chen et al. in view of Tuttle and further in view of Tsukagoshi et al., Kropp et al., or Inoue et al.

In the previous response, Applicant provided a declaration pursuant to 37 CFR §1.132 (hereinafter referred to as the "first declaration") to overcome the obviousness rejections presented against the pending claims. However, the Examiner states the first declaration is deficient for lacking proof that an electrically conductive epoxy adhesive with silane has better electrical conductivity with a nickel surface or battery than a electrically conductive epoxy adhesive of the prior art (i.e., without silane) (pg. 10 of paper no. 20040419). The Examiner states the necessary proof could be demonstrated by a comparison between an

electrically conductive epoxy adhesive with silane additives bonded to a nickel surface or battery versus an electrically conductive epoxy adhesive of the prior art (i.e., without silane) bonded to a nickel surface or battery wherein the electrically conductive epoxy adhesive with silane demonstrates a higher conductivity (pg. 10 of paper no. 20040419). The Examiner states such comparison will be sufficient to overcome the obviousness rejections of the pending claims (pg. 10 of paper no. 20040419).

Accordingly, filed herewith is a Supplemental §1.132 Declaration executed by one skilled in the art, Inventor Rickie Lake, which refers to the Inventor Disclosure of the present invention wherein the Inventor Disclosure provides the comparison and proof requested by the Examiner to overcome the obviousness rejections of the pending claims. Please note, the redacted portions of the Inventor Disclosure are not relevant to demonstrate the comparison and proof requested by the Examiner.

As disclosed in the Inventor Disclosure, a small amount of Z6040 silane agent in a conductive epoxy has been found to significantly improve the electrical conductivity of the conductive epoxy (para. 2.2 of page 1). The proof is presented in the Inventor Disclosure by a comparison between an electrically conductive epoxy adhesive without silane additives (non-Z6040 bearing conductive epoxy) with an electrically conductive epoxy adhesive with silane (Z6040 silane added) (para. 2.3 of page 1). Specifically, a dot of electrically conductive epoxy

adhesive without silane additives (non-Z6040 bearing conductive epoxy) was applied to a coin cell battery (verified by the Inventor to have a nickel surface contact) and measured to have a contact resistance range from 2 ohms to 200 ohms (para. 2.3 of page 1). The same sized dot (specific size of the dot is redacted) of electrically conductive epoxy adhesive with silane (Z6040 silane) was applied to the coin cell battery and measured to have a contact resistance range from negligible to 2 ohms (para. 2.3 of page 1).

Such a comparison of the significant differences in contact resistance is proof of the significant improvement of the electrical conductivity of the electrically conductive epoxy adhesive with silane when used with the nickel surface of a battery. It should be understood that "conductivity is the reciprocal of resistivity" (pg. 92, *Dictionary of Electronics* by E. C. Young, 2nd Ed. 1988), and conversely, "resistivity is the reciprocal of conductivity: the lower the resistivity is of a material the better the conductor it is" (pg. 490, *Dictionary of Electronics* by E. C. Young, 2nd Ed. 1988). Moreover, one skilled in the art understands these relationships between resistivity and conductivity. Consequently, the Supplemental Declaration and Invention Disclosure provide the proof and comparison requested by the Examiner to overcome the rejections against the pending claims. Applicant respectfully requests withdrawal of the obviousness rejections and allowance of claims 9, 12, 14, 23-28 and 51-66 in the next office action.

New dependent claims 67-71 are allowable for depending from allowable independent claim 9.

Moreover, regarding the obviousness rejection against claim 9 based on the combination of Chen in view of Tuttle taken with Tsukagoshi, Kropp, or Inoue, such claim recites providing a curable adhesive composition comprising an epoxy terminated **glycidoxy methoxy silane** and interposing the curable adhesive composition between first and second electronic components, wherein at least one of the components comprises a **nickel containing metal surface** over which the curable adhesive composition is received. The Examiner alleges Chen teaches an epoxy adhesive having a functional silane adhesion promoter for attaching electrical components (pg. 2 of paper no. 20040419). The Examiner next suggests modifying Chen with teachings of Tuttle alleging Tuttle teaches interconnecting electronic components via an epoxy adhesive wherein the components comprise a metal surface containing nickel, for example a battery, and therefore, it would be obvious for one skilled in the art to connect an electrical component with a nickel containing metal surface to another electrical component via an adhesive cured in the method of Chen as suggested in Tuttle (pg. 3 of paper no. 20040419).

However, the first declaration by Rickie Lake demonstrates that it is not obvious to one of ordinary skill in the art to providing a curable adhesive composition comprising an epoxy terminated glycidoxy methoxy silane and

interposing the curable adhesive composition between first and second electronic components, wherein at least one of the components comprises a nickel containing metal surface over which the curable adhesive composition is received as positively recited in claim 9. At the time of Applicant's invention, one skilled in the art did not understand the source of the problem for the poor conduction of the prior art conductive bonding of a nickel containing metal surface and/or battery. Poor wetting characteristics of the conductive epoxy with a nickel containing metal surface (typical metal outer surface of a battery) simply were not understood to be a problem at the time of the invention. Moreover, at the time of the invention, silane additives for epoxy were not known to have been utilized within conductive epoxies for electrical bonding of the conductive epoxies with nickel surfaces and/or batteries. These contentions are clearly evident by the first declaration and, additionally, by the fact that the Examiner has failed to locate one reference that teaches nickel surfaces and/or batteries using silane additives within conductive epoxies for electrical bonding of nickel surfaces and/or batteries.

Once Rickie Lake perceived that the relatively poor conduction of the prior art conductive bonding of nickel surfaces and/or batteries resulted from poor wetting characteristics of the conductive epoxy with the metal outer surface of the battery, he added an epoxy-terminated silane to conductive adhesives to be bonded with batteries. The epoxy-terminated silane significantly improved the

wetting characteristics of the conductive adhesives relative to metal surfaces to be bonded, such as nickel-clad stainless steel of a battery, in a manner which was not understood to have been reported or known in the prior art at the time of the above-referenced invention. Consequently, the Examiner's motivational rationale for combining the references, that is, it would be obvious for one skilled in the art to connect an electrical component with a nickel containing metal surface, such as a battery, to another electrical component via an adhesive cured in the method of Chen as suggested in Tuttle, does not exist. Therefore, the obviousness rejection based on a non-existing rationale for the combination must fail. Applicant respectfully requests withdrawal of this rejection against claim 9 in the next office action.


Moreover, regarding the obviousness rejection against claim 23 based on the combination of Chen in view of Tuttle, the same non-existent motivational rationale used to combine the references for the rejection against claim 9 is presented for this rejection against claim 23 (pgs. 5-6 of paper no. 20040419). Since the motivational rationale does not exist as demonstrated by the first declaration, claim 23 is allowable.

This application is now believed to be in immediate condition for allowance, and action to that end is respectfully requested. If the Examiner's next anticipated action is to be anything other than a Notice of Allowance, the

undersigned respectfully requests a telephone interview prior to issuance of any such subsequent action.

Respectfully submitted,

Dated: 8-26-04

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